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- The education and training of technologists
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#### BRISTOL BRANCH.

1946-7 session concluded with a paper by a local member, Mr. E. T. Gill,
The Use of the Puzzle in the Teaching of Mathematics ".

le success of this session's meetings and the growth of membership apted the Branch committee to apply for representation on the Council be Mathematical Association. Upon approval of this application in June, Pla D. R. Baldwin was elected as the Branch representative on the Council. Infessor H. R. Hassé's term of office as President of the Branch expired

ofessor H. R. Hassé's term of office as President of the Branch expired 47, and Mr. G. W. Hinton was elected as his successor. Professor Hassé one of the original founders of the Branch in 1920, and a tribute to his in his long association with the Branch was paid by Mr. Hinton. The original founders of the 1947–8 session have been held. Mr. W. Hope-Jones

14, Friday, 6th February, 1948, Mr. C. W. Tregenza is visiting the Branch, "Graphs" as his subject. The final meeting of the session is on Friday, March, 1948, to discuss the working of the Alternative Syllabus in the J. K. Dudley, Hon. Sec.

#### NEW SOUTH WALES BRANCH.

#### REPORT FOR 1947.

- $^{\rm x}$  ing the year five meetings were held; the following were the more  $^{28}$  reant items of business :
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- CING PAGE Mr. Kirkpatrick : Alignment charts.
  - Mr. V. Barnes: A nomograph developed in the war period for use with 18-pounder field guns.
  - Discussion introduced by Mr. P. G. Price on the use of standardised tests; in particular, the A.C.F.R. tests in arithmetic.
  - Exhibition of mathematical films, arranged by Dr. Turner.
  - Following on (d) above, an investigation has been begun on the question whitable courses of study for those pupils now in secondary schools of
  - 27 Dus types, and for whom it is felt that the present courses are unsuitable. I. Barnes has agreed to take charge of this investigation, with power to pt members as helpers, and to collect evidence and opinions from teachers. The Australian Mathematics Teacher has completed three years of publications and from every point of view, the venture has been successful. There now more than 700 subscribers, coming from every Australian state, New land, South Africa, Great Britain, Eire, U.S.A., Hong Kong, India; and quest for copies from Roumania. Apart from the inevitable work entailed he production of such a journal, difficulties still being experienced by the using trade make it impossible to have the journal issued at the prescribed

he appreciative references of the retiring President of the Mathematical ociation, Mr. W. F. Bushell, in his Presidential Address last April, are te stimulating. It was also a very kindly action of the Editor of the hematical Gazette to note the efforts of the A.M.T. during 1946.

The financial position of the Branch is satisfactory, especially when considers such adverse factors as high costs of printing, and low subscription rates. The latter is a matter of policy; it is felt that every teacher of m matics in every type of school should be a subscriber; with the low rathe Le

roup. subscription this aim is more likely to be accomplished. At the annual meeting office-bearers for 1948 were elected as foll V. W. President: Bro. Liguori; Vice-Presidents: Professor Wellish, Mr. P. We Price; Joint Hon. Secretaries: Miss I. Barnes, Mr. H. J. Meldrum; Branch Treasurer: Mr. R. J. Gillings; Director of the Problem Bureau: Mr. In assignings; Editorial Committee: Dr. Turner (Chairman), the Executive Of transfer of the Branch, Mr. W. B. Smith-White, Mr. H. Mulhall, Mr. P. G. Price. The I. BARNES, H. J. MELD he ine

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- J. B. Dale. Logarithmic and trigonometric tables. 2nd edition (re-set). Pp. 42. 1947. (Arnold)
- C. V. Durell. General mathematics. IV. Pp. xl, 296, xxxvi. 6s.; without ans 5s. 6d. 1947. (Bell)
- T. Fort. Finite differences and difference equations in the real domain. Pp. vii. 25s. 1948. (Oxford University Press)
- R. L. Goodstein. A textbook of mathematical analysis. The uniform calculus a nd a applications. Pp. xii, 475. 30s. 1948. (Oxford University Press)
- F. Goodyear. The junior draughtsman. III. Pp. 52. 1947. Teacher's hand Pp. 20. 1948. 2s. 6d. (University of London Press)
- I. Pp. alue L. Herman and C. Ross. Algebra for school certificate and matriculation. 2s. 6d.; with answers, 2s. 9d. II. Pp. 248. 3s. 9d.; with answers, 4s. III. Pp. 3s. 6d.; with answers, 3s. 9d. Complete in one volume, 7s. 3d.; with answers, 8s.
- T. H. Ward Hill. Mathematics for modern schools. 11. Pp. 312. 6s. 6d. (Harrap)
- W. V. D. Hodge and D. Pedoe. Methods of algebraic geometry. 1. Pp. viii, 440. hdepe 1947. (Cambridge University Press)
  - F. B. Lennon. Lewis Carroll. Pp. 358. 15s. 1947. (Cassell)
- A. Lichnerowicz. Algèbre et analyse linéaires. Pp. 316. 800 fr. 1947. (Ma Paris)
  - F. S. Nowlan. College algebra. Pp. xiv, 371. 18s. 1947. (McGraw-Hill)
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- R. C. Yates. A handbook on curves and their properties. Pp. x, 245. 83.25. (Edwards, Ann Arbor, Mich.)
- Five-figure tables of natural trigonometrical functions. Prepared by H.M. Nat λ f. manac Office. Pp. iv. 123. 15s. 1947. (H.M. Stationery Office) Almanac Office. Pp. iv, 123. 15s. 1947. (H.M. Stationery Office)

# A RESEARCH PROJECT.

er of m low is the Leicester Branch of the Mathematical Association has formed a research roup. At a recent meeting, three members, E. H. Copsey, H. Frazer and as follow. W. Sawyer gave results to date.

Mr. I We give below a brief summary of this research. The members of the

rum; Franch are to collaborate in obtaining further results. Any person interested: Mr. h assisting is asked to communicate with the Secretary of the Leicester tive Of Franch: R. H. Collins, Gateway School, Leicester.

. Price The object of the work is to discover the best possible expression for K in Melb he inequality

$$\sum_{r=0}^{n} \sum_{s=0}^{n} \frac{a_r a_s}{r+s+1} \le K \sum_{p=0}^{n} a_p^2, \quad ....(1)$$

here the a's are real and positive. Hilbert showed that

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$$\sum_{r=0}^{\infty} \sum_{s=0}^{\infty} \frac{a_r a_s}{r+s+1} \le \pi \sum_{0}^{\infty} a_p^z, \qquad (2)$$

ociety) result which can be proved by integrating  $(\stackrel{n}{\Sigma} a_t z^t)^2$  round a closed contour gmans)

0. 42. 2 onsisting of a semicircle and a diameter. (See Hardy, Littlewood and Pólya, nequalities, for various proofs of Hilbert's inequality.) In (2),  $\pi$  is the best constant, but H. Frazer showed (Journ. London Math. Soc., 21, 1946)

Pp. vii.  $\frac{n}{n}$  at  $(n+1)\sin \pi/(n+1)$  is a better value of K in (1) than  $\pi$ , by integrating  $\sum_{l} a_l z^l / 2$  round a contour consisting of a regular polygon inscribed in a circle  $\frac{1}{2}$  and a diameter. But this is still not the best possible value of K, as can be

r's hand be been by the method which follows. L<sub>1</sub> inequality (1), if  $\lambda$  is the best possible constant, then  $\lambda$  is the maximum I. Pp. value of

$$\left\{ \sum_{r=0}^{n} \ \sum_{s=0}^{n} \frac{a_r \, a_s}{r+s+1} \right\} \left/ \left\{ \sum_{p=0}^{n} a_p^2 \right\} \right. .$$

The maximum value of this expression can be found by equating  $\partial \lambda/\partial a_t$  to s. 6d. ero for each of the (n+1) variables  $a_0, a_1, a_2, \dots a_n$ , and eliminating the n iii, 440. Independent variables  $a_1/a_0, a_2/a_0, \dots a_n/a_0$  from the (n+1) equations. The

$$\begin{vmatrix} 1-\lambda & \frac{1}{2} & \frac{1}{3} & \frac{1}{4} & \dots & \frac{1}{n+1} \\ \frac{1}{2} & \frac{1}{3}-\lambda & \frac{1}{4} & \frac{1}{5} & \dots & \frac{1}{n+2} \\ \frac{1}{3} & \frac{1}{4} & \frac{1}{5}-\lambda & \frac{1}{6} & \dots & \frac{1}{n+3} \\ \dots & \dots & \dots & \dots & \dots \\ \frac{1}{n+1} & \frac{1}{n+2} & \frac{1}{n+3} & \dots & \dots & \frac{1}{2n+1}-\lambda \end{vmatrix} = 0,$$

hich when expanded is an equation of the (n+1)th degree in  $\lambda$ . The maximized which when expanded is an equation of the constant in (1), and is tabulated s3.25. The root is the best possible value of the constant in (1), and is tabulated elow, the value of  $(n+1)\sin \pi/(n+1)$  being given for comparison; the values M. Nat  $\lambda$  for  $n=3, 4, \ldots 19$ , have been obtained by mechanical methods by the ational Physical Laboratory and the Royal Aircraft Establishment.

| n   | λ (largest root) | $(n+1)\sin \pi/(n+1)$ |
|-----|------------------|-----------------------|
| 0   | 1.00000          | 0                     |
| 1 ' | 1.26759          | 2.00000               |
| 2   | 1.40832          | 2.59808               |
| 3   | 1.50021          | 2.82843               |
| 4   | 1.56705          | 2.93893               |
| 5   | 1.61890          | 3.00000               |
| 6   | 1.66089          | 3.03719               |
| 7   | 1.69594          | 3.06147               |
| 8   | 1.72588          | 3.07818               |
| 9   | 1.75192          | 3.09017               |
| 10  | 1.77488          | 3.09906               |
| 11  | 1.79537          | 3.10583               |
| 12  | 1.81383          | 3.11110               |
| 13  | 1.83059          | 3.11529               |
| 14  | 1.84593          | 3.11868               |
| 15  | 1.86004          | 3.12145               |
| 16  | 1.87309          | 3.12374               |
| 17  | 1.88522          | 3.12567               |
| 18  | 1.89654          | 3.12730               |
| 19  | 1.90714          | 3.12869               |

rofess It would be useful to find the equation of the  $n, \lambda$  curve from the above results. This has not yet been done although a fair approximation is

$$1/(\pi - \lambda) = 0.12889 \log_{8} (n + \frac{3}{2}) + 0.41538,$$

which was obtained empirically; this result is within 1 per cent. up to n=1but gets steadily worse as n increases. The main problem is still to find the n,  $\lambda$  relation either empirically or by analytical considerations.

An account of this research has appeared in Nature, March 6th, 1948.

# LEICESTER AND COUNTY BRANCH.

THIS Branch was founded in October 1947 and has some forty members. For he thr meetings have been held. The first was a symposium, contributors bein 39 no Mr. R. H. Collins (Visual Aids in Grammar Schools), Mr. W. E. Date (Matherell at matics in the Modern School), and Mr. R. Kitchen (The Technical School an Mathematics). Mr. I. R. Vesselo paid us a welcome visit and showed us some films and film strips, including one in the course of manufacture. On the 20th October (at which meeting the Branch was formally constituted) Mr. M. Moroney gave a talk on "Statistics in Schools and Industry". A novel part H. V. the evening was a practical demonstration of statistical techniques. On th H7. (13th February Mr. E. H. Copsey (Gateway School) brought along a group F. C. boys of 12+ and demonstrated his technique for teaching with the aid of meklan film strip. At the same meeting Mrs. E. M. Williams (Principal, Humberston H. Be, Training College) initiated a discussion on Mathematics and the Trainin fascicus. College.

The first chairman of the Branch, Mr. W. W. Sawyer, has left us to take univers an appointment at Achimota College. We shall miss him very much; h W. G initiative and drive were mainly responsible for the foundation of the Branch assers

A novel feature of our work has been the formation of a research group assers

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ome valuable work has been done and results to date were by Mr. E. H. Copey, Dr. H. Frazer and Mr. W. W. Sawyer. Details will be found elsewhere in his Gazette.

The Officers are: Chairman, Professor R. L. Goodstein (University College, eicester); Secretary, Mr. R. H. Collins (Gateway School, Leicester); Treaurer, Miss F. E. Billsden (Newark Girls' School, Leicester ).

R. H. COLLINS, Hon. Sec.

#### YORKSHIRE BRANCH.

REPORT FOR 1947.

Five meetings were held during the year.

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On 15th March, a discussion on the new alternative syllabus in Mathematics or the J. M. B. School Certificate was opened by Mr. P. J. Wallis, who gave a rief history of movements for reforms in school certificate syllabuses and iscussed the main features of the new J.M.B. syllabus. Miss C. Bain, following, resented the point of view of a girls' school.

On 10th May, Mr. E. K. Clarke, Principal of Risley Training College, opened discussion on Mathematics in the Secondary Modern School. He outlined ome experimental work on mental age groups and attainments in Mathematics. fr. J. A. Young and Mr. A. H. Hall, lecturers at Risley T. C., and a number of fodern School teachers contributed to an interesting discussion.

The Summer Meeting on June 14th was held at Harrogate Grammar School. rofessor H. C. Ruse, Leeds University, gave a lecture entitled "What is e abov cometry?", in which he outlined the early history of geometry and then ealt in greater detail with nineteenth and twentieth century developments in a attempt to find a satisfactory answer to the question.

On 18th October, Dr. B. L. Welch, Leeds University, spoke on "Statistics to n= to n= sa Subject in Schools and Universities". He first described the extension of tatistical methods from social studies to the natural sciences and then xamined the possibility of teaching statistics in schools. At this meeting the ranch bade farewell to Mr. R. M. Gabriel, who had been appointed Professor f Mathematics at the University of Otago, New Zealand.

On 22nd November, Mr. C. W. Gilham, Leeds University, gave a paper ntitled "Can Its History Illuminate the Teaching of Mathematics?" He sed, as illustrations, number notation, some topics in the theory of numbers, sed, as illustrations, number notation, some topics in the theory of numbers, so the three classical problems in geometry, the history of  $\pi$  and some astronomy. It is a sequence of the seq

#### BOOKS RECEIVED FOR REVIEW.

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Derston H. Beghin. Cours de mécanique. Pp. 602. 1800 fr. 1947. Édition provisoire polycopiée, Trainin fascicules. (Gauthier-Villars)

Ram Behari. The differential geometry of ruled surfaces. Pp. 94. N. p. 1946. Lucknow

ch; h W. G. Borchardt. Algebra for beginners. Pp. vi, 272, xliv. With appendix: with Branch aswers 5s., without answers 4s. 6d.; without appendix: with answers, 4s. 6d., without appendix: with arguer aswers, 4s. 1948. (Rivingtons)

C. A. Coulson. Electricity. Pp. xii, 254. 10s. 6d. 1948. University Mathematics Texts. (Oliver and Boyd)

Associ R. D. Douglass and D. P. Adams. Elements of nomography. Pp. ix, 209. \$3.50. 1947 the cou (McGraw-Hill)

C. V. Durell. General mathematics: supplementary volume. Pp. vii, 112, viii. 3s. 9 be ava 1948. (Bell)

W. L. Ferrar. Higher algebra. Pp. vi, 320. 17s. 6d. 1948. (Oxford University Pres

Das mathematische Werkzeug des Chemikers, Biologen, Statistikers un Soziologen. 3rd edition. Pp. 308. Brosch. Sw. fr. 14; geb. Sw. fr. 18.50. 1947. (Ore Füssli, Zürich)

M. E. J. Gheury de Bray. Elementary hyperbolics. (Re-issue.) Pp. xi, 351; xii, 20 16s. 1947. (Technical Press, Ltd.)

F. Gonseth. La géométrie et le problème de l'espace. III. L'édification axiomatique Pp. 112. Sw. fr. 7.40. 1947. (Griffon, Neuchatel; H. K. Lewis, London)

S. L. Green. Dynamics. Pp. 264. 10s. 6d. 1948. (University Tutorial Press)

L. W. Griffiths. Introduction to the theory of equations. 2nd edition. Pp. ix, 278. 18 1947. (John Wiley, New York; Chapman and Hall)

L. M. Kells. Elementary differential equations. 3rd edition. Pp. xiv, 312. \$3. 194 from r (McGraw-Hill)

E. R. Kiely. Surveying instruments. Their history and classroom use. Pp. xiii, 41 high. N. p. 1947. Nineteenth Yearbook of the National Council of Teachers of Mathematis enligh (Bureau of Publications, Teachers College, Columbia University, New York)

J. H. Lambert. Opera Mathematica, II. Edited by A. Speiser. Pp. xxix, 324. Geralsolu Sw. fr. 25. 1948. (Orell Füssli, Zürich)

H. V. Lowry and H. A. Hayden. Introductory mathematics. Pp. 159. 4s. 1948. (Long Astron mans) geome

N. W. McLachlan. Modern operational calculus. Pp. xiv, 218. 21s. 1948. (Macmillar astron L. M. Milne-Thomson. Theoretical aerodynamics. Pp. xvii, 363. 40s. 1948. (Macmin mal

D. S. Nathan and O. Helmer. Analytic geometry. Pp. x, 402. \$3.75. 1947. (Prentice resum Hall, New York)

J. B. Sidgwick. The heavens above. Pp. xv, 282. 21s. 1948. (Geoffrey Cumberleg Oxford University Press)

W. M. Smart. John Couch Adams and the discovery of Neptune. Pp. 56, 5s. 1947. (Roy less p. Astronomical Society, Burlington House, London, W.1.)

E. S. Smith, M. Salkover and H. K. Justice. Unified calculus. Pp. x, 507. 21s. 194 (John Wiley, New York; Chapman and Hall)

Sir John Townsend. Electrons in gases. Pp. viii, 166. 25s. 1948. (Hutchinson)

D. Williams. A realistic approach to number teaching. Pp. 95. 3s. 6d. 1948. (Geoffire ments Cumberlege, Oxford University Press)

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# ANNUAL GENERAL MEETING, BIRMINGHAM, 1949

ematic ARRANGEMENTS have been made for the next Annual General Meeting of the Association to be held in **Birmingham**, from 20th to 23rd April, 1949. Through the courtesy of the University of Birmingham, accommodation and meals will 0. 1947 be available for members. 3s. 9d

#### MIDLAND BRANCH 1947-8.

President: Mr. K. L. Wardle.

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Secretaries: Miss L. E. Hardcastle, Mr. A. Hinckley.

Treasurer: Mr. M. A. Porter.

Committee: Misses Barnes, Ray, Randle, Robinson, Messrs. Sealey, Moore, Cutting, E. V. Smith.

Papers were given as follows:

78. 18 4th October. Mr. C. W. Tregenza, H.M.I., "The Teaching of Graphs". A most stimulating and practical paper demonstrating the use of material from many branches of science, obtained by experiment and observation. 3. 1941

15th November. Mr. H. A. Petch on "The Standardisation of Marks", xiii, 411 nematic enlightening us on the elimination of the disturbing effects of a large examining panel, the papers and in fact everything but the candidate in securing an 4. Gel absolute standard.

6th December. Mr. P. F. Burns, late H.M.I., dealing with "The Place of (Long Astronomy in a School Course of Mathematics" explained how ordinary geometrical instruments could be used to give a surprisingly large amount of acmillar astronomical knowledge; and described international cooperation of schools (Macmi in making earth measurements.

31st January. Mr. A. Robson, "The Teaching of Geometry", gave a Prentice resumé of the evolution of geometrical teaching in the present century and his own ideas of how the subject should be taught.

nberlege 6th March. Mr. K. L. Wardle gave his Presidential Address on "The Lighter Side of Mathematics", showing how some appreciation may be induced in our (Roy less promising pupils and stressing the fact that the important thing is not what we teach but the amount of thinking obtained from the pupils. ls. 1947

5th June. Mr. M. A. Porter dealt with "Some Assumptions in Mechanics" with special reference to Newton's Laws and Impact.

Miss L. E. Hardcastle spoke on "Introductory Geometry without Instru-Geoffice ments", using paper-folding, cardboard and needle with coloured threads.

# QUEENSLAND BRANCH.

## REPORT FOR THE YEAR 1947-1948.

The Annual Meeting was held at the University on 21st May, 1948. The Report and the Financial Statement for the year were presented and were adopted.

Two ordinary meetings were held at the University during the year. At the first, on 8th August, 1947, Mr. H. M. Finucan gave a paper on "Some Mathematical Puzzles", and at the second, on 7th November, Mr. E. W. Jones read a paper on "The Teaching of Trigonometry".

The number of members of this Branch is 32, of whom 10 are members of

the Mathematical Association (one a Life Member). There is also one junior L. O. member. The Financial Statement shows a credit balance of £19 10s. 4d. at elege I the end of the year. The Mathematical Gazette is circulated among Associate 7.L. I Members as it comes to hand. The thanks of members is due to those who take Harvard the trouble to prepare papers for meetings. A. S.

At the Annual Meeting, the President, Professor E. F. Simonds, gave an hapman

address on "Mathematical Induction". N. H. The present committee is : President, Prof. E. F. Simonds ; Vice-Presidents (Mat Mr. R. A. Kerr, Mr. I. Waddle; Hon. Sec. and Hon. Treasurer, Assoc. Prof. J. S. H. P. McCarthy; Members, Miss E. H. Raybould and Messrs. J. C. Deeney, S. G. ad edit Brown, E. W. Jones, P. B. McGovern. F. H. 1

J. P. McCarthy, Hon. Secretary.

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- J. W. Archbold. An introduction to the algebraic geometry of a plane. Pp. xiii, 300. 25 G. W. 1948. (Arnold)
- R. C. Archibald. Mathematical table makers. Portraits, paintings, busts, monument 6. H. (Scriptons. 19 bio-bibliographical notes. Pp. 82. 1948. Scripta Mathematica Studies, 3. Mathematica, Yeshiva University, New York, 33)
- athematica, Yeshiva University, New York, ээ) H. Athen. Ebene und sphärische Trigonometrie. Pp. 112. DM. 7.50. 1948. (Wolfen p48. bütteler Verlagsanstalt)
- H. Athen. Vektorrechnung. Pp. 90. DM. 6.50. 1948. (Wolfenbütteler Verlagsanstall C. O.
- C. Attwood. Practical five-figure mathematical tables. Pp. v, 74. 3s. 1948. (Mac nswers millan)
- W. Blaschke. Analytische Geometrie. Pp. 152. DM. 10.50. 1948. (Wolfenbüttele Longin Verlagsanstalt)
- L. Brand. Vector and tensor analysis. Pp. xvi, 439. 33s. 1947. (John Wiley, New York: Chapman & Hall)
- F. G. Brown. Everyman's mathematics. Pp. xviii, 747. 36s. 1947. (Angus & Robert son, Sydney and London)
- B. R. Buckingham. Elementary arithmetic. Its meaning and practice. Pp. viii, 744 24s. 6d. 1947. (Ginn)
- H. S. Carslaw and J. C. Jaeger. Operational methods in applied mathematics. 2nd edition Pp. xvi, 359. 20s. 1948. (Oxford)
- J. B. Channon and A. McL. Smith. A school algebra. Pp. xi, 437, x. With answer bry of 7s. 6d. 1948. (Longmans)
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- H. Hahn and A. Rosenthal. Set functions. Pp. ix, 324. \$12. 1948. (University 'New Mexico Press, Albuquerque, New Mexico)
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- junio L. O. Kattsoff. A philosophy of mathematics. Pp. ix, 266. \$5. 1948. (Iowa State a. 4d. a follege Press, Ames, Iowa)
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- ho take Harvard University Press; Geoffrey Cumberlege, London)
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- Prof. J. S. H. Moorfield and H. H. Winstanley. Mechanics and applied heat, with electrotechnics. vy, S. G. ad edition. Pp. xi, 324, 64. 7s. 6d.; without electrotechnic section, 6s. 1948. (Arnold)
- F. H. Newman and V. H. L. Searle. The general properties of matter. 4th edition. Pp. xi, etary, 31. 21s. 1948. (Arnold)
  - J. L. Prak. Mathematical-technical test. Tests, cards and key. (Harrap)
  - E. E. Preidel. Intermediate hydrostatics. Pp. 247. 9s. 6d. 1948. (University Tutorial
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- 8. 1948 J. F. Ritt. Integration in finite terms. Liouville's theory of elementary methods. Pp. vii, 00. 15s. 1948. (Columbia University Press; Geoffrey Cumberlege, London)
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- mument G. H. Thomson. The factorial analysis of human ability. 3rd edition. Pp. xvi, 392. (Scripton), 1948. (University of London Press)
- C. Truesdell. An essay towards a unified theory of special functions. Pp. iv, 182. 16s. (Wolfer 248. Annals of Mathematics Studies, 18. (Princeton University Press; Geoffrey umberlege, London)
- sanstalt Install C. O. Tuckey and W. Armistead. New syllabus algebra. Pp. viii, 201. 5s.; without (Mac aswers, 4s. 6d. 1948. (Cambridge)
- c. O. Tuckey and F. J. Swan. Geometry for Sixth Forms. Pp. vi, 250. 7s. 6d. 1948. nbüttele Longmans)
  - Annals of the Computation Laboratory of Harvard University.
    - 7. Tables of the Bessel functions of the first kind of orders 10, 11, 12. 55s. 1947.
    - 8. Tables of the Bessel functions of the first kind of orders 13, 14, 15. 55s. 1947. 9. Tables of the Bessel functions of the first kind of orders 16 through 27. 55s. 1948. 16. Proceedings of a symposium on large-scale digital calculating machines. Pp. xxix,
    - 302. 55s. 1948. 17. Tables for the design of missiles. Pp. lv, 226. 50s. 1948.
      - (Harvard University Press; Geoffrey Cumberlege, London)
- dedition Tables of Bessel functions of fractional order. I. Prepared by the Computation Labora-answer by of the National Bureau of Standards. Pp. xli, 413. 1948. (Columbia University ress)
- Guidance pamphlet in mathematics for high school students. Final Report of the Comiels. 3rd ission on post-war plans of the National Council of Teachers of Mathematics. Pp. 25. d. 194 Sc.; orders of more than 10, 10c. each. 1947. (Mathematics Teacher, 525 W. 120th St., lew York)
  - Mathematics. Our great heritage. Essays selected and edited by W. L. Schaaf. Pp. 91. \$3.50. 1948. (Harper, New York)
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It has become a recognised authority in its own department, and is continuing to exert an important influence on methods of examination.

#### THE MATHEMATICAL GAZETTE

THE MATHEMATICAL GAZETTE (published by Messrs. G. Bell & self of Sons, Ltd) is the organ of the Association. It is issued at least five variety times a year. The price per copy (to non-members) is usually 4s. seuss The Gazette contains articles, notes, reviews, etc., dealing with elementary mathematics, and with mathematical topics of general interest.

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#### AUCKLAND BRANCH.

#### REPORT FOR 1947.

we very successful meetings were held in 1947. The first was addressed by r. Murdoch, who discussed the treatise that he is preparing entitled "Matheatics in Secondary Schools". He described the different sections in this ork, giving also the scope of each chapter. Many interesting points arose, particular the weakness of many Training College students in mathematics of the fact that, as no arithmetic or mathematics is required in the Training blege, it is possible for a teacher to be trained without his acquiring a eater knowledge of mathematics than the contents of Core Mathematics. Mr. H. Henderson, now Chief Inspector of Post-primary Schools, addressed r second meeting, his subject being "The Place of Mathematics in Educaon". The speaker outlined the changes in Secondary School mathematics nich had come with the new curriculum. He very thoroughly discussed e place of Core Mathematics and justified the inclusion of statistics in optional Mathematics. As a result of his criticism that "the needs of the iences and of the applied sciences were such that the prescriptions which had

ad prescriptions in these examinations. Although membership of the Branch is not great, meetings are well attended. e have a number of country members, and our numbers are still on the E. H. DRIVER, Hon. Sec.

long remained unaltered for University Entrance and Entrance Scholarship ere no longer adequate ", a committee was set up to consider the standard

# LIVERPOOL MATHEMATICAL SOCIETY.

### (Liverpool Branch.)

#### REPORT FOR SESSION 1947-48.

HE Branch was glad to welcome several new members during the year; embership was 73 in June 1948. Meetings throughout the year have been 371, as ell attended, the maximum number present being 70.

The following meetings were held during the session:

October 13th. Mr. A. W. Sanford, of Liverpool College, gave his Presiwithin ential Address on "Maps and Mathematics". He described the organisation id computation of a formal first-class survey, compared the various methods ho are sed, and discussed the accuracy obtained in filling in the detail of the map. matics. November 10th. Professor M. H. A. Newman, of Manchester University, ection. at alk on "Mathematics and Machines", gave a vivid account of the ection attraction at the problems raised by work with calculating machines. He showed he advantages of an iterative process, and analysed in detail the determinaon of a square root as the limit of a sequence.

December 8th. Mr. W. W. Sawyer, of the Leicester College of Technology, oke on "The Teaching of Mathematics to Non-Mathematicians". The ain theme of this stimulating address was the necessity of arousing the sterest of the non-mathematician before formal work could be started suc-SELL & ssfully. He had himself found that boys could always be intrigued by the ast five variety of models, covering a wide range of interests, were exhibited and

ally 45. discussed.

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January 26th. Dr. C. Gattegno, of the London Institute of Education, in s address on "The Abstract in School Mathematics", discussed some of e common mistakes made by children in elementary mathematics, and uphasised the necessity of the teacher understanding the cause of these mistakes before he could usefully attempt a cure. It was important appreciate that each new idea introduced in algebra, for example, involved the

further degree of abstraction for the child.

March 1st. Mr. A. W. Siddons, speaking on "The Teaching of Ratio a other Elementary Topics", described the methods of teaching ratio wh were in use before the Society for the Reform of Geometrical Teaching (la the Mathematical Association) had done its good work. He told us of own early difficulties when he insisted on teaching the use of trigonometric and logarithmic tables at Harrow. Several points connected with mode methods in the teaching of ratio were discussed, and Mr. Siddons stressed advantages of introducing trigonometry at an early stage.

Annual General Meeting.

Officers were elected for the Session 1948-49. President: Professor J. Whittaker; Secretary: Miss J. S. Batty; Treasurer: Mr. D. C. Gilles.

Mr. R. L. Plackett, of the Department of Applied Mathematics, gave talk on "The Teaching of Statistics in Schools". Mr. Plackett suggest Boar that for a Sixth Form course in Statistics it was essential to use practistant methods to illustrate statistical concepts. Instructive games were make valuable; for example, one could use the roulette wheel, the sample bott contributions. and games of darts, in all of which the class could take part. Tables meth "random numbers" could be used to form random samples from a norm Ja population, and tests of significance could be illustrated.

In January the Branch received a parcel of food sent by Miss Gibbons behalf of the Victoria Branch of the Mathematical Association. The Bran welcomes this opportunity to express their keen appreciation of this general gift, and sends grateful thanks and good wishes to the Victoria Branch.

J. S. Batty, Hon. Secretary.

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#### MANCHESTER BRANCH.

REPORT FOR 1947-48.

Six meetings were held during the year.

The Annual General Meeting was held on 30th September, 1947, and t business of the meeting was followed by an address from the retiring President Miss Holman. Miss Holman's subject was "Mathematical Books for t Library Shelf". The lecturer gave an exhaustive and detailed review of large number of books which was greatly appreciated by her audience.

On 27th November the Branch heard Mr. W. F. Bushell on "A Century School Mathematics", and the audience was appreciatively entertained by

series of anecdotes about the mathematical teachers of the past.

The Annual Joint Meeting with Manchester University Mathematic Society was held on 28th January. Professor A. G. Walker's subject w "Projective Geometry, with a finite number of points". This proved interesting exposition of what to many of us was a new approach to t teaching of projective geometry.

We were visited on 2nd March by Mr. P. F. Burns who addressed us on the subject of "Astronomy in a School Mathematics Course". The lecturer ga at M spherical trigonometry, which indicated that this subject could, with profinging

be introduced into a junior course.

On 11th May, Mr. J. A. Clayton spoke to us on "An Approach to t Wal Teaching of Rotational Inertia ". The speaker stressed the difficulty, while faced newcomers to the sixth form, in obtaining a conception of "Rotation Inertia", and proceeded to show that the concept could be developed analogy from dynamical equations of pure translations.

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involves the mathematical papers set in the N.U.J.M.B. examinations of 1948. The final meeting of the session was held on 19th July with a discussion of was forwarded to the Northern Provincial Education Sub-Committee.

#### SHEFFIELD AND DISTRICT BRANCH.

th mode The following meetings were held during the Session 1947-48.

October 7th, 1947. Mr. J. Gagan, Firthpark Grammar School, Sheffield, spoke on "Informal Methods in the Teaching of Mathematics". In an absorbing lecture the speaker outlined novel methods of introducing many essor J. familiar results, and demonstrated his own collection of beautifully-constructed

November 26th, 1947. Mr. J. A. Petch, Secretary of the Joint Matriculation suggest Board, spoke on the subject "School Certificate and Higher School Certificate e practic Standardisation". Mr. Petch explained that the final examination results were more always the product of many different factors, and indicated where pole bott control, in the form of standardisation, was necessary. He outlined the Tables methods whereby the Joint Matriculation Board exercise this control.

a norm January 21st. 1948. Annual General Meeting. The business meeting.

January 21st, 1948. Annual General Meeting. The business meeting was followed by a lecture by Professor A. G. Walker, University of Sheffield, Sibbons entitled "Finite Geometry". Professor Walker explained the difficulties in the Bran seaching the process of abstraction, and suggested that Finite Geometry s generous might be a suitable medium for such an introduction. He then gave examples anch. of systems where space contained only a finite number of points, and showed ecretary, that the Axioms of Projective Geometry were all satisfied. All the usual familiar results of Projective Geometry could be demonstrated, and there was an underlying Finite Algebra which would enable us to build up an Analytic Representation of the Geometry.

April 21st, 1948. Mr. W. Hope-Jones spoke on "Can we teach more Mathematical Geography?" Mr. Hope-Jones made suggestions for pruning the normal Mathematics Syllabus, especially for weak pupils, and put forward plea for the mathematics of the sphere. He dealt with the general question of angle measurement, with latitude and longitude, and worked a number of nteresting examples of the determination of the distance between two points on the earth's surface.

May 25th, 1948. Mr. J. F. Hinsley, Edgar Allen & Co., Ltd., Sheffield, poke on "Industrial demands on Mathematical Training". After giving thematic maniples of everyday applications of elementary mathematics, including a thematic surprising application of Pappus' Theorem, Mr. Hinsley dealt more fully with the problem of Heat Flow in connection with the Forging of Heavy Castings. The lecture was illustrated by many lantern slides of considerable interest.

ocial evening together on Friday, 5th December, 1947, when the Branch turer gas it Messrs. Field's Café, Sheffield, the party visited the Sheffield Playhouse. In addition to these meetings, about thirty members enjoyed a pleasant The ordinary meetings have been well attended and membership main-

Officers. President: Mr. R. R. S. Cox; Vice-Presidents: Professor A. G. ch to twalker, Dr. J. R. Thompson, M.C.; Honorary Treasurer: Mr. J. W. Cowley. C. R. BARWELL, Hon. Secretary.

## THE EDUCATION AND TRAINING OF TECHNOLOGISTS.

FOLLOWING the Percy Report on Higher Technical Education and the Parlia mentary and Scientific Committee's Report on Colleges of Technology and Technological Manpower, the Institute of Physics set up a committee under the chairmanship of Dr. H. Lowery, and has now issued the report of the the committee under the above title. To summarise the findings and proposal Plym of this report without extensive quotation is not easy; those who wish to ubject read the document in full may obtain copies gratis from the Institute of Both lis in Physics, 47 Belgrave Square, London, S.W. 1.

The formation of the committee was due to disagreement with the method to the which had been proposed for increasing the supply of trained technologist. The for industry, although the need for such an increase is freely admitted. The fr. V. main disagreement is threefold, that some radical difference from present Profes methods is essential, that short-term palliatives will unduly delay the estab vas relishment of a rational scheme without producing any significant interin. The improvement, and that difficulties in the way of inaugurating a rational. A. West, system of technological education are grossly over-emphasised.

The main proposal of the report is the speedy creation of a number of well lining equipped and well-staffed Colleges of Technology, independent of, but of statul Pro comparable with, the Universities. Their geographical location, and the the comparable with, the Universities. Their geographical location, and the nature of their departments and courses, should correspond generally to the distribution of industry. Courses should normally be full-time, of three year of P. duration, with entry at something like present Intermediate level. The slevel should lead to an award, and a degree of B.Tech. is suggested. "Junior bllow instruction should not be given, but postgraduate study, and research upor technological problems, should be encouraged. Some instruction in "pure science, including mathematics, would of course be a necessary part of the bllow on

It is hoped that the above brief summary fairly outlines the proposals. A riven regards comment, what follows must be regarded as the present writer owev purely personal opinions.

The proposals appear to me to be based upon a false dichotomy as between beturn "pure" science and technology. Surely the need is that the interdependence or. Go of and interplay between them should be more clearly and more generally countries. recognised; any course which tends still further to dissociate them will be renet 6th A disservice to both.

Agreeing generally with the conviction expressed in the report that there Mr. is room for improvement in quality and type of technological training nor the Al available, my experience leads me to doubt the existence of an untappe one reservoir of potential students of the right quality and type reservoir of potential students of the right quality and type.

The staffing of such Colleges is perhaps the crucial problem, and the diff in 13t culty is likely to be increased by a policy which would seem entirely to banis ollow. technology from the Universities. As regards teachers of mathematics is The technical schools and colleges, a report on their training has been prepare ributions. by the Technical Sub-Committee of the G.T.C. of the Mathematical Associa appro tion, and is ready for printing.

At the same time, the boldness of the suggestions can be admired, an xamp complete agreement can be recorded with an attitude of mind which refuse lecting to allow expediency to hamper or difficulty to daunt the execution of a cours exeter of action which is believed to be right.

18th May, 1948.

W. G. BICKLEY France

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## PLYMOUTH AND DISTRICT BRANCH.

REPORT OF THE SESSION 1947-48.

e under t of the first meetings of the year, held at Exeter on 4th November and at proposal Plymouth on the following day, were addressed by Mr. P. F. Burns on the wish to ubject: "The Place of Astronomy in a School Course of Mathematics". titute Both meetings were well attended, and Mr. Burns brought to the South-west is inimitable and enthusiastic treatment of the subject, so much appreciated method at the General Meeting of the Mathematical Association in 1947.

nologist The Annual General Meeting was held at Plymouth on 25th November. ed. The Mr. V. Naylor, M.Sc., was elected President for 1948; Dr. M. Stimson and presen Professor T. A. Brown were elected Vice-Presidents; Mr. W. G. Tamlin, B.Sc.,

ne estab vas re-elected Secretary and Treasurer.

e Parlia logy and

intering The business meeting was followed by the Presidential Address. Professor rational. A. Brown, M.A., B.Sc., F.R.S.E., of the University College of the South-West, chose as his subject: "The Elementary Treatment of Maxima and of well Minima ".

of statu. Professor Brown later repeated his address for the benefit of our members and the the Exeter district on 3rd February, 1948.

y to the On 25th February the Secretary exhibited a number of Film Strips, include ee year ng Pythagoras' Theorem, Introduction to Graphs, the Football Field, and the Junior blowed on the subject of films as an educational medium, with particular ch upon eference to those shown.

"pure" This exhibition was repeated in Exeter on 2nd March, and was again of these blowed by considerable discussion.

On 10th March Dr. J. Goodier of St. Luke's College, Exeter, was to have On 10th March Dr. J. Goodier of St. Luke's Coulege, Exeter, was to nave sals. A liven a lecture at Plymouth on the M.K.S. System of Units. Dr. Goodier, writer owever, was taken ill rather suddenly while lecturing in London, and this eture had to be postponed. Mr. J. Williams, M.Sc., who was giving a between eture at Exeter on High Speed Fluid Motion, very kindly consented to take bendene Dr. Goodier's place, and a small Plymouth audience profited by Mr. Williams' generally ecount of the mathematical treatment of the flow of air around solid objects will be enertating the "sonic barrier". This talk was repeated at Exeter on 6th March.

Vr. A. P. Rollett collected together a number of the models be showed at

at ther Mr. A. P. Rollett collected together a number of the models he showed at ing not be Annual General Meeting of the Association in 1945, and augmented by intappe ome recent additions used them to very good effect to illustrate a fascinating ecture on "Mathematical Models". Mr. Rollett gave this lecture in Exeter the diff a 13th April, and travelled to Plymouth to grip a second audience on the o band bllowing evening.

natics in The session was concluded rather late this year by a very interesting conprepare ribution by Miss L. E. Hardcastle, who chose as her subject: "A Practical Associa pproach to Elementary Mathematics ". The Secretary takes credit for per-uading Miss Hardcastle to frame a short talk around those fascinating red, an examples of coloured thread designs which were shown at the Annual General herefuse leeting of 1947, and to travel to the South-West to entertain audiences at a course to the course of the c

This session has been the most successful for the Plymouth and District BICKLET Franch since its activities were seriously curtailed by the war. Its total embership of 36 full members and 6 associate members could be increased well over the 50 mark if members who have joined the Branch would member to renew their subscriptions in time.

As shown in this report, efforts have been made to meet the needs of members in the Plymouth and Exeter districts, and it is hoped to include

other centres in Devon and Cornwall as the venue of some of the meetings the Branch. The Secretary would be pleased to hear from any member pres resident in the South-West in connection with this suggestion.

W. G. Tamlin, Honorary Secretary.

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#### SOUTH-WEST WALES BRANCH.

REPORT FOR 1947-8.

On 7th December, 1947, Mr. H. J. Godwin, Lecturer in Mathematics Swansea University College, gave an address entitled "An Outline of Statistic with reference to School Courses". After indicating briefly the parts Statistics which could be dealt with in schools, Mr. Godwin made a plea for its inclusion on grounds of its intrinsic educational value, not merely as part of Mathematics, but as a means of teaching caution in the making inferences and of appreciating the significance of approximations.

On 6th March, 1948, the Branch was honoured by a visit from Mr. A. V Siddons, a past Chairman of the Association, who spoke on "Some of the Changes in Mathematical Teaching in the Last Fifty Years". He describe the improvements that had taken place, particularly in the teaching Geometry, the overthrow of Euclid, the increased use of riders, the ear introduction of Trigonometry, etc., and stressing the need for continual exper ment, gave an account of modern trends. The lecture was especially valuab to the younger members.

6th May, 1948. Through the courtesy of Mr. W. Flemming, a number members were enabled to attend the lecture on "Visual Aids in the Teaching of Mathematics" given by Mr. R. H. Collins at Trinity College, Carmarthe and to inspect the vast array of models he had brought with him.

29th May, 1948. Mr. C. C. Hurst (of Educational Publicity, Ltd.) gave demonstration of three Mathematical Film Strips: the Football Field, the Bicycle, and Chess. They aroused considerable interest and keen discussion The thanks of the Branch are due to the Victoria Branch for the receip-

early in 1948, of a food parcel, which was put to good use.

Also to Mr. S. Davies for his services as Branch Chairman over a long period Miss H. M. Cameron has been appointed Branch President for 1948–9.

Number of Members, 14. Number of Associates, 18.

T. G. FOULKES. Hon. Sec.

#### INTERNATIONAL CONGRESS OF MATHEMATICIANS.

An International Congress of Mathematicians will be held in Cambridge Massachusetts, from August 30 to September 6, 1950, under the auspices the American Mathematical Society. The Society originally planned to a as host for a Congress in September, 1940, which was also scheduled to me in Cambridge. However, the outbreak of World War II made it necessary postpone the Congress and, consequently, there has been no internation gathering of mathematicians since 1936. It is the sincere hope of the America Mathematical Society that the gathering in 1950 will be a truly internation one, with all countries well represented. The Council of the American Math matical Society has voted unanimously to hold a Congress which will be open to mathematicians of all national and geographical groups.

Time and Place. The dates for the Congress have been fixed as August 3 Pp. 5 September 6, 1950. Harvard University will be the principal host institution A number of other institutions in metropolitan Boston will join in the ente math tainment of Congress visitors by arranging special features on their campuse der n cretary.

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eetings Type of Congress. In recent years mathematicians have been much immember pressed by the success of the conference method for presenting recent research in fields in which vigorous advances have just been made or are in progress. The 1950 Congress will include Conferences in several fields. Following established custom, there will also be a number of invited hour addresses by outstanding mathematicians. In addition, sectional meetings for the presentation of contributed papers not included in Conference programmes will be held in the following fields: I, Algebra and Theory of Numbers; II, Analysis; III, Geometry and Topology; IV, Probability and Statistics, Actuarial Science, Economics; V, Mathematical Physics and Applied Mathematics; Statistic VI, Logic and Philosophy; VII, History and Education.

The official languages of the 1950 Congress will be English, French, German.

a plea for Italian and Russian.

Organisation. The plans for the Congress are under the supervision of an naking Organising Committee which was elected by the Council of the American Mathematical Society in February, 1948. The Chairman is Professor Garrett Birkhoff of Harvard University, and the Vice-Chairman is Professor W. T. ne of the Martin of Massachusetts Institute of Technology. Professor J. R. Kline of describe the University of Pennsylvania has been named Secretary of the Congress.

Entertainment. Harvard University has offered the use of its dormitories the ear and dining-rooms for mathematicians and their guests for the period of the al exper Congress. The Organising Committee hopes that it will be possible to furnish valuab board and room without charge to all mathematicians from outside the North American continent who are members of the Congress. Congress number membership fees will be announced well in advance of the opening of the Teachin Congress. Every effort will be made to facilitate the travel at reasonable marthe cost of foreign participants while in the United States.

Information. Detailed information will be sent in due course to mathe-1.) gave matical societies and academies for communication to their membership. Field, the Individuals interested in receiving information may file their names in the iscussio office of the American Mathematical Society. Communications should be e receip addressed to the American Mathematical Society, 531 West 116th Street, New York City 27, U.S.A.

THE ORGANISING COMMITTEE.

### BOOKS RECEIVED FOR REVIEW.

A. D. Booth. Fourier technique in X-ray organic structure analysis. Pp. vii, 106. 12s. 6d. 1948. (Cambridge)

H. S. M. Coxeter. Regular polytopes. Pp. xix, 321. 50s. 1948. (Methuen)

A. Hess. Praktische Mathematik. Pp. 116. Sw. fr. 8.90. 1947. (Rascher Verlag,

E. Hille. Functional analysis of semi-groups. Pp. xi, 528. \$7.50. 1948. American essary Mathematical Society Colloquium Publications, 31. (American Mathematical Society)

W. V. Houston. Principles of mathematical physics. 2nd edition. Pp. xii, 363. 30s America 1948. (McGraw-Hill)

V. Inglada. Metodos para la resolucion de los problemas geometricos. Pp. 477. 110 n Math pesetas. 1948. (Dossat, Madrid)

M. G. Kendall. Rank correlation methods. Pp. vii, 160. 18s. 1948. (Griffin)

L. Locher-Ernst. Differential- und Integralrechnung in Hinblick auf ihre Anwendungen. igust 3 Pp. 594. Sw. fr. 48. 1948. (Birkhäuser, Basle)

stitutie W. Magnus und F. Oberhettinger. Formeln und Sätze für die speziellen funktionen der he ente mathematischen Physik. 2nd edition. Pp. viii, 230. Dm. 24.60. 1948. Die Grundlehren ampuse der mathematischen Wissenschaften, 52. (Springer, Berlin)

- G. P. Meredith. Algebra by visual aids. I. Polynomials. II. The continuum. III. The laws of calculation. IV. Choice and chance. 10s., 8s. 6d., 7s. 6d., 9s. 6d. Answers 6s. 1948. (Allen and Unwin)
- N. Miller and R. E. K. Rourke. Plane trigonometry and statics. Pp. xii, 427. \$1.65.
  1946. An advanced course in algebra. Pp. xv, 394. \$1.35. 1947. (Macmillan Company, Canada)
- E. A. Milne. Kinematic relativity. Pp. vi, 238. 25s. 1948. (Geoffrey Cumberlege, Oxford University Press)
- E. A. Milne. Vectorial mechanics. Pp. xiii, 382. 36s. 1948. (Methuen)
- J. von Neumann. Les fondements mathématiques de la mécanique quantique. Pp. 335 10s. 6d. 1946. (Centre National de la Recherche scientifique, Paris; London agents, H. K. Lewis)
- G. H. R. Newth. Mental arithmethic. Revision and speed tests for secondary schools. Pp. 48. 2s. 6d. 1948. (Macdonald)
- C. G. Nobbs. Elementary calculus and coordinate geometry. I. Pp. 255. 12s. 6d 1948. II. Pp. 399. 17s. 6d. 1949. (Oxford University Press)
  - O. Ore. Number theory and its history. Pp. x, 370. 27s. 1948. (McGraw-Hill)
- J. L. Prak. Mathematical and technical tests manual. Pp. 30. 3s. 6d. 1948. (Harrap)
  A. Robson. Examples in mathematics for fifth and lower sixth forms. Pp. 63. 2s. 6d. 1948. (Bell)
- D. E. Rutherford. Substitutional analysis. Pp. xi, 103. 25s. 1948. (University of Edinburgh Press)
- M. Savage. Sport with figures. Pp. 38. 3s. post free. (Savage, Upper Basildon, Reading)
- J. B. Scarborough and R. W. Wagner. Fundamentals of statistics. Pp. vii, 144. 13s. 1948. (Ginn)
- J. Schillinger. The mathematical basis of the arts. Pp. x, 696. \$12. 1948. (Philosophical Library, New York)
- B. Segre. Lezioni di geometria moderna. I. Fondamenti di geometria sopra un corpo qualsiasi. Pp. iv, 195. L.1200. 1948. (Zanichelli, Bologna)
  - J. V. Uspensky. Theory of equations. Pp. vii, 353. 27s. 1948. (McGraw-Hill)
- H. S. Wall. Analytic theory of continued fractions. Pp. xiii, 433, 36s. 1948. (Van Nostrand, New York; Macmillan, London)
- A. N. Whitehead. An introduction to mathematics. 12th impression. Pp. 191. 5a. 1948. (Geoffrey Cumberlege, Oxford University Press)
- Sir Edmund Whittaker. The modern approach to Descartes' problem. Herbert Spencer Lecture. Pp. 30. 1s. 6d. 1948. (Nelson)
- G. E. Williams. Technical literature, its preparation and presentation. Pp. 117. 7s. 6d. 1948. (Allen and Unwin)
- Addition and subtraction facts and processes. Pp. 66. 1s. 1948. Publications of the Scottish Council for Research in Education, 28. (University of London Press)
- The Lewis Carroll Puzzle Book. Edited by D. B. Eperson. Pp. 32. 2s. 6d. 1948. (Appeal Office, 97 Crane Street, Salisbury, Wilts)
- Tables of the Bessel functions of the first kind of orders 28 through 39. Pp. 694. 55a. 1948. Annals of the Computation Laboratory, Harvard University, X. (Harvard University Press; Geoffrey Cumberlege, London)

The collected works of J. Willard Gibbs, I, II. Rep. Pp. xxviii, 434; xviii, 207, vi, 284. 88. 1948. (Yale University Press; Geoffrey Cumberlege, London)

#### COMPUTATION OF TABLES

The London Mathematical Society needs assistance for extending a mathematical table of the late Col. Cunningham. Slight knowledge of Theory of Numbers desirable but not essential. Reasonable fees will be paid. Apply to Dr. Western, Windwhistle, Grayshott, Hindhead, Surrey.

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